

Kentucky Route 1754 Bridge
Spanning the Chaplin River,
on Kentucky Route 1754
Chaplin vicinity
Nelson County
(Washington County)
Kentucky

HAER No. KY-22

HAER
KY,
90-CHAP.V,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
Southeast Region
National Park Service
U. S. Department of the Interior
Atlanta, Georgia 30303

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Location: Spanning the Chaplin River, on Kentucky Route 1754
Chaplin vicinity, Washington and Nelson counties,
Kentucky

UTM: 16.658400.4194960
Quad: Chaplin, Kentucky

Date of Construction: 1910 (estimated)

Builder/Designer: Unknown

Present Owner: Kentucky Transportation Cabinet
State Office Building
Frankfort, Kentucky 40622

Present Use: Vehicular bridge

Significance: A one-lane pin-connected metal Parker truss bridge,
one of only four in Kentucky.

Historian: Jayne C. Henderson

The Kentucky Route 1754 bridge is eligible for listing in the National Register of Historic Places. The bridge crosses the Chaplin River near Chaplin, in northeastern Nelson County. The Chaplin River is the boundary between Washington and Nelson counties in central Kentucky. Kentucky Route 1754 is a two-lane state route, and the Chaplin River forms part of the Salt River drainage basin.

The Kentucky Route 1754 Chaplin River bridge is a one-lane, pin-connected, metal Park truss, 200 feet long, 1.57 feet wide, and composed of ten panels. Although the designer and builder of the bridge is unknown, a construction date of circa 1910 is based on similar examples.

A parker truss is a Pratt truss with a polygonal top chord for additional strength and length. On all truss spans, the end posts and top chord act in compression, with the bottom chord in tension. In a truss, unlike a rigid arch, at least one bearing point at the abutment must be able to expand or move. In the Pratt truss, the verticals between the end posts go into compression to keep the top chord from collapsing, and the diagonals act in tension to support the deck.

Pratt trusses have both diagonals and counters in the web system, acting in tension. Diagonals support the dead load of bridge weight and the live load of traffic. Counters support only the live load of the bridge. Counters always intersect with the diagonal between two panel points (or floor beams) of the bridge. Because they support no dead load, a Pratt truss with an odd number of panels cannot have counters in the center panel, but has intersecting diagonals that help support the dead load of bridge weight.

Counters accept or counteract the live load support from the diagonals as a load moves across the bridge. Tension support for the deck goes from a diagonal past the compression post, which is released as a load passes, to the next counter or diagonal. When a load passes an interior compression post and it is released, the compressive stress is thrown into the adjacent compression posts or end posts to keep the top and bottom chords apart.

The end posts, top chord and vertical compression posts must be sturdy members which are built with rolled channel and plate sections with lacing bars, heavy angles with lacing bars or plates, or rolled I-beams. The tension members (diagonals, counters, hip-vertical, and bottom chord) are usually single or double angle bars or rectilinear, round or square eyebars. All counters (or diagonals in the center panel) on pin-connected trusses are eyebars with turnbuckles and sleeve-nuts for field adjustment. These turnbuckles and sleeve-nuts were either original equipment or were added by KYDOH, as years of stress weakened the span, necessitating field tightening to increase rigidity.

The members of the Kentucky Route 1754 Chapin River Bridge are constructed of the following elements: end posts and top chords are two channels, cover plate and lacing bars; bottom chords and diagonals are two die-forged

rectilinear eyebars; hip-verticals and top lateral struts are paired angles and lacing bars; intermediate posts are two channels with lacing bars; counters are two square loop-welded eyebars and turnbuckles; top and bottom lateral bracing is composed of single round rods. The floor system consists of a wood deck, rolled I-beam floor beams and stringers that are rolled I-beams except on the outside where channels are utilized. Some materials in the superstructure were supplied by the Illinois-USDA foundry, identified by a stamp on the channels. The substructure of the bridge is rough cut stone abutments with a concrete cap.

The first widespread bridge construction efforts in Kentucky materialized during the late 19th century. During this period, Pratt and Warren trusses accounted for a great majority of bridges constructed. As bridge designs evolved, many later truss improvements retained the Pratt configuration of compression and tension members, while changing the shape of the top chords. The parker truss is clearly a Pratt with a polygonal top chord. Because of the polygonal top chord, the Parker is stronger than a regular Pratt, but uses nearly the same amount of materials.

In Kentucky, the parker truss was constructed between 1905 and 1940. Most of the 33 parker trusses still on the highway system were built between 1927 and 1936 by the Kentucky Department of Highways. During this period, few pin-connected trusses were being constructed and 88% of the parker trusses in Kentucky use riveted connection. In Kentucky, only four parker trusses, all probably dating from an early period, are pin-connected.

As one of the four remaining pin-connected parker truss bridges on the Kentucky highway system, the Kentucky Route 1754 Bridge is a rare surviving example that possesses integrity of location, design, setting, materials and workmanship.